

RTA's and Agricultural Trade: A Retrospective Assessment

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Abstract

This article examines the impact of six regional trade areas on agricultural trade. Five are of recent origin: AFTA, APEC, CER, CUSTA, and MERCOSUR. The sixth, the EU, has a longer legacy. All of these areas, with the exception of APEC, are formalized agreements. Except for AFTA, all have imported increasingly more agricultural goods from member states than from the rest of the world since the mid-1980's. This raises a concern about whether integration has lowered world economic welfare through agricultural trade diversion. Empirical evidence shows that, with the notable exception of the EU, none of the regional trade agreements (RTA's) diverted agricultural trade at the sector level. The analysis also shows that the CER, CUSTA, and MERCOSUR created agricultural trade.

Introduction

Agricultural markets in many countries have gradually opened to world trade since the mid-1980's. Countries have adopted domestic market-oriented reforms, honored timetables for reducing tariffs under the Uruguay Round, and joined regional trade areas and/or agreements. Researchers have described the progress toward free trade in agricultural products as being glacial (Barichello *et al.*, 1991): "The situation changes at a speed so slow that the observer may think there is no movement at all. But, as with a glacier, there is an underlying flow so inexorable that it is hard to think of the trend being soon reversed."

Regional trade agreements (RTA's) can advance the cause of trade liberalization. They can free up markets by reducing tariffs among member countries, albeit at

the risk of diverting trade away from nonmember countries. They can also facilitate agreement on contentious issues that confound the multilateral trade negotiations of the World Trade Organization, such as the harmonization of technical standards and the formation of technical working groups that address pesticide regulations, phytosanitary restrictions, and product quality standards—all of which may be disguised nontariff barriers.

Within the past decade, many prominent economists (Bergsten, Dornbusch, Krugman, Summers) have become advocates of regional blocs as a practical means to achieve freer trade (*Economist*, various years). Many policymakers believe that RTA's make markets more efficient—neoclassical theory says that the reduction of international trade barriers shifts world production toward efficient producers and enables consumers to purchase goods at lower prices. But the growth in

intraregional trade and the recent proliferation of RTA's concern others who worry that RTA's may diminish welfare gains from multilateral trade liberalization (*Economist*, Oct.18, 1997; and Panagariya, 1996).

A welfare problem may exist because RTA's extend preferences to (and, therefore, discriminate in favor of) partner countries. Whether any individual RTA advances the well-being of society—that is, its trade-creating effects dominate its trade-diverting effects—is an empirical issue. This article addresses this question by examining agricultural trade of six regional trade areas, namely AFTA, APEC, CER, CUSTA, EU, and MERCOSUR.¹ All of these areas, except APEC, possess formal agreements.

World Agricultural Trade Is Becoming More Regionalized

Figure 1 puts regional agricultural imports into a global perspective by showing trade shares of the 34 countries belonging to 6 regional trade areas. The importance of member countries in global imports does not appear to have changed much in the last 25 years. Collectively, these countries accounted for 62 percent of global trade in agricultural goods in 1995, the same percentage as in 1970 and the 1970-95 average. By contrast, the share of their intraregional trade to global trade rose more than 10 percentage points between 1970 and 1995, increasing to 40.3 percent by 1995. This suggests the rising importance of regionalization in world agricultural trade.

¹The 18 original APEC countries are Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Malaysia, Mexico, New Zealand, Papua New Guinea, Philippines, Singapore, South Korea, Taiwan, Thailand, and the United States. Russia, Peru and Viet Nam joined in 1998. The AFTA countries are Brunei, Indonesia, Malaysia, Philippines, Singapore, and Thailand. The CER countries are Australia and New Zealand. The CUSTA countries are Canada and the United States. The EU countries are Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the United Kingdom. The MERCOSUR countries are Argentina, Brazil, Paraguay, and Uruguay.

The total value of intraregional imports in comparison with member imports from all suppliers shows how deep integration is. Increases in intraregional trade shares depict increased reliance upon regional sources of supply. Declining shares indicate decreased dependence. Figure 2 shows how intraregional import shares of the specific regional trade areas changed between 1970 and 1995.²

The European Union's (EU) precursor, the European Economic Community (EEC), established the Common Agricultural Policy (CAP) in the early 1960's to manage the agricultural market. The aim was to improve farmer income, stabilize the market, and guarantee regular supplies for consumers. The CAP promoted free internal trade by granting preferences to member-country suppliers, as demonstrated by the intra-EU share of agricultural imports rising from 28 percent in 1962 to 70 percent in the 1990's.

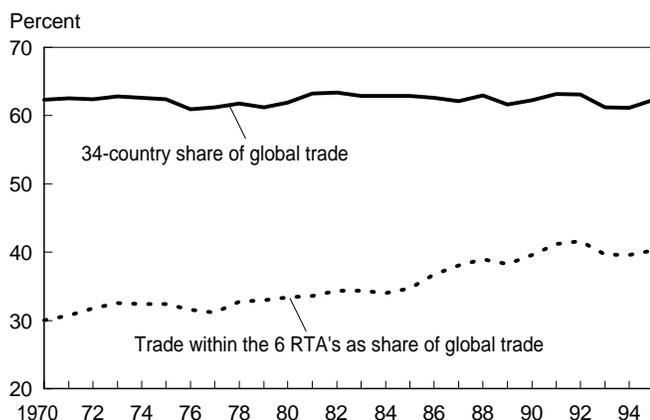
Australia and New Zealand established the Closer Economic Relations (CER) in 1983. Within 5 years, the agricultural import shares that Australia and New Zealand supplied each other increased 10 percentage points to 27 percent, before reaching what appears to be a new structural equilibrium (23-25 percent).

The Canada-U.S. Free Trade Agreement (CUSTA) was formally launched in 1989. As with the CER, the intra-CUSTA share of Canadian and U.S. trade increased for several years before leveling off. The sharp rise in intraregional trade shares immediately following the birth of both CER and CUSTA suggests that integration induced a change in the sourcing of agricultural imports—one that favored member-country suppliers.

In 1988, MERCOSUR established an economic union between Argentina and Brazil after years of unilateral tariff reductions in both countries. This early liberalization altered the agricultural price structure within both countries, inducing changes in the pattern of their agri-

²MERCOSUR is not included in figure 2 only because it would render the chart hard to read.

Figure 1
Growing importance of regionalization in global agricultural trade*



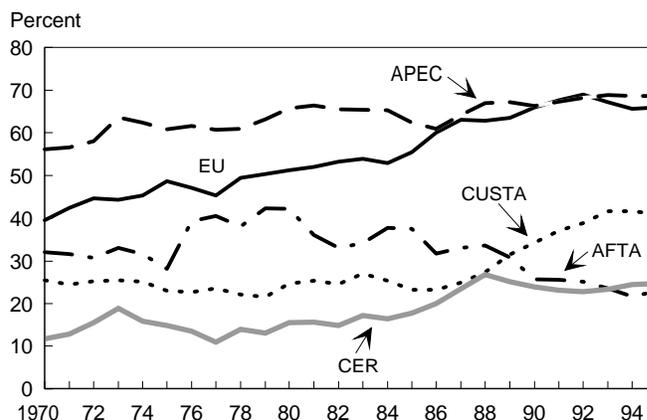
*34 countries belonging to APEC, AFTA, CER, CUSTA, EU & MERCOSUR.

cultural imports. From 1983 to 1990, the share of intra-MERCOSUR trade doubled, rising to 60 percent. After declining sharply between 1990 and 1991, this share moved upward again with the expansion of MERCOSUR to include Paraguay and Uruguay in 1991.

Members of the Association of Southeast Asian Nations (ASEAN), originally formed for political and military reasons in 1967, formally launched the ASEAN Free Trade Area (AFTA) in 1991. Little incentive exists for AFTA countries to import many agricultural goods from each other, given similarity in their resource endowments and production patterns. Indeed, intra-AFTA trade shares show that member countries have become less dependent upon each other to supply domestic agricultural import needs within the last 15 years (fig. 2).

The Asia-Pacific Economic Cooperation (APEC) Forum, unlike the other regional trade agreements, is a *prospective* RTA. APEC has yet to sanction any concrete trade disciplines. The steady growth in intra-APEC trade, as with MERCOSUR, predates formal integration. APEC's membership includes both major agricultural exporters, such as the United States, Canada, and Australia, as well as large and/or rapidly growing agricultural importers like Japan, South

Figure 2
Share of agricultural imports provided by member countries



Arrows identify years that regional trade areas were created.

Korea, Taiwan, Singapore, Hong Kong, and China. The mix of supplying and purchasing countries is favorable to growth in intraregional trade.

Trade shares provide some insight into the changing structure of agricultural trade. But, an economic framework is needed before welfare implications can be drawn about the formation of these regional trade areas. The concepts of trade creation and trade diversion are central in determining whether an individual regional trade area or RTA advances freer world trade or diminishes world welfare.

A Search for Trade Creation and/or Trade Diversion

According to Viner (1950), *trade creation* occurs when imports are substituted for domestic products as a result of tariff reductions that reduce the price of member imports below that of home-produced goods. *Trade diversion* occurs with a shift in imports from an efficient nonmember exporter to a more expensive producer from the country's RTA partners due to preferential tariff treatment. Trade diversion, in Viner's view, does not necessarily mean a decline in trade, but rather a shift in trade away from least-cost suppliers.

Meade (1955) extended the concepts of trade creation and trade diversion to include trade expansion, which occurs whenever demand is highly price-responsive. Should the prices consumers pay for agricultural goods decline following the imposition of an RTA, imports expand if the price elasticity of demand is greater than one.

Trade creation/diversion associated with the elimination of internal duties can be evaluated from a country, regional, or global perspective. Here, the issue is addressed within the context of RTA-member and RTA-nonmember suppliers offering agricultural goods in the international market using an empirical model first developed by Balassa (1967). Economic implications are drawn for the six regional trade areas and the world at large.

Balassa was interested in assessing the welfare impact of European integration. He developed an economic model because it was not possible to observe directly how much trade would have taken place in the absence of the EEC. The analytical framework requires three types of import demand functions to be estimated—one typifying imports from member countries, another imports from nonmember countries, and finally total imports. The model generates *ex post* income elasticities of import demand in periods preceding and following the creation of the EEC. The difference in the two period elasticities “correspond to Meade’s extended concepts” of trade creation and trade diversion (Dayal and Dayal, 1977).”

The generated elasticities measure the relative responsiveness of imports to changes in both income and prices. Being *ex post* estimates, they reflect both substitution effects (movement along indifference curves), as well as income effects (movement from one indifference curve to another) (Balassa, 1963). An RTA that purchases goods from lower-priced suppliers induces trade expansion because of the direct price and income effects of integration. Lower prices and increases in real income entail movement to an indifference curve

farther from the origin.³ Conversely, an RTA that purchases goods from high-priced suppliers induces movement to an indifference curve closer to the origin.

Assuming that the generated elasticities would have remained unchanged in the absence of integration, Balassa reasoned that a rise in the income elasticity for intra-regional imports following RTA creation indicates *gross trade creation* and that a rise in the income elasticity for imports from all sources together expresses *trade creation proper*. Similarly, *external trade creation* would be signified by a shift of imports from partner-country to nonpartner producers when the income elasticity of demand for extra-area imports rose.

Trade diversion is revealed by a decline in the income elasticity of demand for extra-area imports following integration. This occurs when an RTA supports high-priced production by shifting from efficient nonmember producers to less efficient RTA-partner producers. Trade diversion involves a misallocation of resources, causing not only global trade to contract but world economic welfare to decline.

To obtain the necessary elasticities, Balassa (1967, 1974) simply divided the percent change in imports by the percent change in income. Subsequently, a number of researchers, also investigating the impact of EEC integration, used regression analyses to estimate the elasticities from import demand functions (Kreinin, 1969; Sellekaerts, 1973; Truman, 1969; and Thorbecke and Pagoulatos, 1975).

In this study, the *ex post* income elasticities of import demand were calculated using the following model:

$$\ln M = \beta_0 + \beta_1 \ln Y + \beta_2 D + \beta_3 [(\ln Y) * D] + \epsilon$$

where M is the sum of RTA-member agricultural imports expressed in constant 1987 terms, Y is the

³These welfare implications relate to the static payoffs from neoclassical theory.

1987 dollar value of RTA gross national product (GNP), D is the dummy variable with the value of 0 for the pre- or previous-integration years and unity for the post- or modern-integration years, and ϵ is the stochastic error term. Agricultural trade data are from ERS's reconciled UN Comtrade. Real GNP data were obtained from the World Bank's CD-Stars disk. These

data were not available prior to 1970. For this reason, Balassa (1974) elasticity estimates for intra, extra, and total trade were used for the 1953-59 and 1959-70 periods (table 1).

The income elasticity for the pre-integration period is $\hat{\beta}_1$ and for the post-integration period, the sum of $\hat{\beta}_1$ and $\hat{\beta}_3$.

Table 1--Ex post income elasticities of import demand for agricultural goods¹

	Pre-integration period	Post-integration period	Ex post income elasticity of import demand		Difference	Chow test
			Pre-period (β_1)	Post-period ($\beta_1 + \beta_3$)	Post-period / pre-period (β_3)	F-statistic
Total-area imports						
Trade creation proper						
AFTA	1970-92	1993-95	0.83*	1.58	0.75	0.99
APEC	1970-88	1989-95	1.31*	1.59	0.28	2.61
CER	1970-83	1984-95	0.69*	3.81	3.12*	27.90*
CUSTA	1970-88	1989-95	1.32*	2.56	1.24*	14.40*
EU	1953-59	1959-70	1.67^	1.53	-0.14^	
EU	1959-70	1971-95	1.53^	1.02	-0.49*	
MERCOSUR	1970-88	1989-95	1.16*	5.84	4.68*	4.67*
MERCOSUR	1970-90	1991-95	1.16*	4.31	3.15	9.36*
Intra-area imports						
Gross trade creation						
AFTA	1970-92	1993-95	0.71*	1.32	0.61	1.51
APEC	1970-88	1989-95	1.52*	1.80	0.28	0.82
CER	1970-83	1984-95	1.14*	4.92	3.78*	13.80*
CUSTA	1970-88	1989-95	1.36*	4.43	3.07*	34.40*
EU	1953-59	1959-70	2.56^	2.51	-0.05^	
EU	1959-70	1971-95	2.51^	1.92	-0.59*	
MERCOSUR	1970-88	1989-95	1.06*	5.12	4.06*	10.72*
MERCOSUR	1970-90	1991-95	1.06*	4.77	3.71	15.18*
Extra-area imports						
External trade creation or trade diversion						
AFTA	1970-92	1993-95	0.88*	1.63	0.75	3.79*
APEC	1970-88	1989-95	0.97*	1.16	0.19	1.07
CER	1970-83	1984-95	0.63*	3.54	2.91*	25.40*
CUSTA	1970-88	1989-95	1.30*	1.45	0.14	0.07
EU	1953-59	1959-70	1.43^	1.04	-0.39^	
EU	1959-70	1971-95	1.04^	-0.12	-1.16*	
MERCOSUR	1970-88	1989-95	1.22*	6.71	5.49*	2.73
MERCOSUR	1970-90	1991-95	1.22*	3.89	2.67	4.24*

¹ UN-FAO-defined agriculture.

* statistically significant at 5-percent level.

^ estimates from Balassa (1974).

(Estimated coefficients are denoted by beta hats, $\hat{\beta}$'s). Both the intercept, β_0 , and the intercept dummy, β_2 , are included in the empirical model for statistical, not economic, reasons. The β_0 intercept embodies the mean effect of omitted variables and, thereby, ensures that the estimating equation conforms to the classical assumption that the expected value of the error term is zero; the β_2 intercept dummy guarantees that the parameter estimate of the slope dummy, $\hat{\beta}_3$, is not biased.

The econometric model is not perfectly specified. There is no provision for gauging the impact of the Uruguay Round. Unfortunately, it is not possible for regression techniques to distinguish between regional-trade-area and Uruguay-Round effects until more time passes and additional data become available. It is important to bear in mind, when interpreting the econometric results, that the slope dummy variable may be upwardly biased. The Uruguay Round, an omitted variable, is expected not only to have a positive influence on agricultural imports, the dependent variable, but is likely to be positively correlated with the regional trade areas.

Empirical Findings

The empirical findings are summarized in table 1 using Balassa's terminology. "Gross trade creation" relates to Viner's trade-creation scenario whereby imports from partners belonging to the same regional trade area are implicitly compared with domestic sources of supply. "Trade diversion" and "external trade creation" relate to Viner's trade-diversion scenario whereby imports from members are compared with those from nonmembers. "Trade creation proper" compares domestic sources of supply with all foreign sources.

RTA member countries are interested in determining whether gross trade creation characterizes their union. Meanwhile, nonmember countries are interested in determining whether external trade creation or trade diversion dominates. Global welfare increases when intra-area trade creation outweighs extra-area trade diversion. This is measured by trade creation proper.

The results of both individual *t*-tests on the slope coefficients as well as *Chow* tests, which determine whether observations in both the pre- and post-integration periods belong to the same regression model, are shown in table 1. Estimated β_1 income coefficients were always statistically significant at the 5-percent level. Individual tests for the slope dummies showed β_3 to be significant in most cases.

Change in trade patterns attributable to the formation of regional trade areas was confirmed in two-thirds of the cases examined, as revealed by the *F*-statistics exceeding the critical value of 3.44. But the null hypothesis (no difference between the two periods) was not rejected among any of the APEC and AFTA supplying markets except for extra-AFTA suppliers. However, in this latter instance, the *t*-null hypothesis that β_3 equaled zero was "accepted," meaning that AFTA probably did not affect trade with nonmember suppliers.

The econometric results show neither trade creation nor trade diversion in APEC or AFTA. These results are not particularly surprising. APEC lacks a formal agreement among members. As a consequence, no trade disciplines have been imposed. The countries belonging to AFTA have similar resource endowments and produce similar types of agricultural goods. There is, therefore, little economic incentive for them to increase agricultural trade among themselves despite the existence of a formalized agreement.

But the empirical evidence points to trade creation in the CER, CUSTA, and MERCOSUR. In these three RTA's, the income elasticities of agricultural import demand increased for intra-area, extra-area and total trade following integration. The changes in these elasticities suggest that once agricultural markets become more open, consumers readily shift to lower-priced foreign sources of supply.

There is no evidence of trade diversion in the CER, CUSTA, or MERCOSUR. In fact, the CER and MERCOSUR are associated with external trade creation, as demonstrated by the rise in their extra-area

import demand elasticities after the pre-integration period. The statistically significant t-statistics for the slope dummies depicting extra-area imports support the view that these two RTA's have become more reliant upon agricultural imports from not only member countries but from the rest of the world.

Agricultural trade was created by CUSTA in its supplying markets. But the rise in the income elasticity for imports from member suppliers was considerably greater than the rise in the elasticity from all suppliers. While the responsiveness of agricultural imports to income growth in CUSTA almost doubled for total-area imports, it tripled for intra-area imports. This nonuniformity suggests CUSTA may have enhanced market efficiencies between Canada and the United States.

Post-period elasticities in the CER and MERCOSUR were three to five times greater than pre-period elasticities, indicating substantial trade creation, both proper and gross. Moreover, percentage changes in their extra-area and intra-area elasticities show that both CER and (pre-1991) MERCOSUR integration were associated with more rapid growth in external than internal trade creation. These results support the view that these RTA's did not divert agricultural trade from more efficient nonmember suppliers, but created trade worldwide as more open markets unleashed dynamic efficiency gains.

Post-integration import demand elasticities fell in all three markets for the EU. This can be explained by the slowdown in the growth of EU agricultural imports and the decline in the longrun income elasticity of demand for agricultural goods in member countries. The relevant test for trade diversion in the EU case involves a comparison of the change in their intra elasticities with their change in the extra elasticities. The empirical results indicate that the EU may have shifted from nonpartner to partner sources of supply in the post-1970 period. Notice that the drop in the extra-EU elasticity between 1959-70 and 1971-95 (1.16) is greater than the drop in the intra-EU elasticity (0.59). These results, albeit based upon tenuous extrapolations

using Balassa's estimates, suggest continued agricultural trade diversion in the EU.

Summary

Trade-share analysis shows that the agricultural trade of member economies of the major RTA's is being increasingly dominated by intra-regional trade. The formation of regional trade areas may have influenced the growth in regionalization. In AFTA, however, intraregional trade did not increase following the establishment of its free-trade agreement because member countries possess competitive, not complementary, production patterns in agriculture. Moreover, intraregional trade has increased in APEC, despite the absence of binding agreements. APEC countries have complementary production and consumption patterns in agriculture.

It is difficult to draw economic inferences from an analysis of trade shares alone. We, therefore, use an economic model of trade creation and trade diversion to draw economic implications about the changing patterns of agricultural imports. This model utilizes import demand elasticities to assess the impact of specific RTA's on economic welfare. However, the empirically generated elasticities may embody effects other than RTA's, such as rational expectations about the Uruguay Round.

The econometric results suggest that not all regional trade areas have had an impact on economic welfare as a result of altering agricultural trade patterns. Neither APEC nor AFTA display evidence of either creating or diverting agricultural trade. However, the CER, CUSTA, and MERCOSUR were found to have had positive influences on economic welfare and to have helped open members to the world agricultural economy. Each of these regional trade agreements has created more agricultural trade than it has diverted, in contrast to the EU.

The story is still unfolding. Fully envisioned regional-trade-area liberalization has not yet been achieved.

APEC is not yet a *bona fide* RTA. All regional trade areas analyzed in this study are programmed to become more open in the future. Within CUSTA, and its NAFTA extension, for example, commodities are classified into categories that became duty-free immediately in 1994, and others that will be freed in 5, 10, and 15 years. But, there can be some backsliding. After agreeing to put into place a common external tariff in 1995, MERCOSUR members increased external tariffs by 3 percent this past November (*Economist*, Dec. 20, 1997).

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